 Compound interest
- Say you invest $100 and make 7% annually
- After one year you have: $100 + $100*7/100 = $107
  You made $7.00
- If you leave it invested, and make another 7% the next year, you have: $107 + $107*7/100 = $114.48
  You made $7.49

**Debt and Payments**
- Example debt:
  - Beginning balance $1000
  - Interest rate 13% annually
  - Make a payment of $300 per year
- After one year you owe: $1000 + $1000*13/100 = $1130 ($120 in interest)
- Then you pay $300, so you owe $1120 - $300 = $870
- The next year, you owe: $870 + $870*13/100 = 983.10$ ($113.10 in interest)
- Pay another $300, and get down to $683.10

**New Assignment**
- Given a debt amount, interest rate and monthly payment, figure out how long it takes to pay off the debt, and how much you end up paying in interest.

**“Compounded monthly”**
- Instead of computing and adding interest every year, do it every month.
- Use interest rate of (13 / 12)\% = 1.0833\% every month
- Is 13\% compounded monthly better than 13\% compounded annually? Is it exactly the same?
- We’ll write a program to figure this out, using the main technical feature we’ll need in the compound interest program – the while loop.
While loop

- Do a block of statements a bunch of times.
- Stop when something changes.

While Boolean is True:

- Do statements in block

While loop does block over and over, until the Boolean expression becomes False somehow.

Infinite loop

- One of the classic programming bugs
- Get out of it using CRTL-c (hold down control key and type c)
- Repeat after me: CRTL-c

Ways a program can fail

- Crash: gets to a statement Python cannot execute, program stops and prints red error messages.
- Infinite loop: gets stuck doing the same thing over and over, will never escape.
- Often when a program “goes away” it is in an infinite loop.

EIR program

- Study this program on the course Web page.

Prettier Output

- You can ask Python to cut off extra decimal places.

```
"%.2f" % totalInterest
```

- First part says output will be a string with two digits after decimal place, made out of a float
- % operator connects format and floating point data
Challenging Assignment

- If you understand this, you are home free in this course.
- Work hard at it this week. Go to section. Go to lab hours. Start the program early.
- You may work with a partner on this assignment! Make sure you both understand what is going on.